Predicting the Incidence of Brucellosis in Western Iran using Markov switching model

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Research note

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Abstract

Objective

Brucellosis is a zoonosis almost chronic disease. Brucellosis bacteria can remain in the environment for a long time. Thus, climate irregularities could pave the way for the survival of the bacterium Brucellosis. Brucellosis is more common in men 25 to 29 years of age, in the western provinces, and in the spring months. The aim of this study is to investigate the effect of climatic factors as well as predicting the incidence of Brucellosis in Qazvin province using the Markov switching model (MSM). This study is a secondary study of data collected from 2010 to 2019 in Qazvin province. The data include Brucellosis cases and climatic parameters. Two state MSM with time lags of 0, 1 and 2 was fitted to the data. The Bayesian information criterion (BIC) was used to evaluate the models.

Results

According to the BIC, the two-state MSM with a one-month lag is a suitable model. The month, the average-wind-speed, the minimum-temperature have a positive effect on the number of brucellosis, the age and rainfall have a negative effect. The results show that the probability of an outbreak for the third month of 2019 is 0.30%.